
A New Species and New Combinations in *Roldana* (Asteraceae: Senecioneae) from Mexico

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ABSTRACT. Revisionary studies of *Roldana* show that the following new combinations should be made: *R. anisophylla* (Klatt) Funston, *R. gonzalezi* (B. L. Turner) Funston, *R. hirsuticaulis* (Greenman) Funston, *R. mezquitlanensis* (B. L. Turner) Funston, *R. neogibsonii* (B. L. Turner) Funston, and *R. sundbergii* (B. L. Turner) Funston. The species *R. tlacotepecana* Funston was also discovered and is newly described here. It is a small perennial herb with a 1- to 3-headed paniculate cyme and radiate capitula. The distribution is restricted to the pine-oak forests of Cerro Teotepec in the mpio. Tlaco-tepeca, Guerrero, Mexico.

Key words: Asteraceae, Mexico, *Roldana*, Senecioneae.

The genus *Roldana* La Lave & Lexarza contains ca. 50 species and is distributed in the highlands from southern Arizona southward to Panama. It is a segregate of *Senecio* L. (Barkley et al., 1996). In a series of papers on the genera of Senecioneae in Mexico and Central America, Robinson and Brettell (1973a, 1973b, 1973c, 1974) were the first modern workers to recognize the genus. In my dissertation (Funston, 1999 unpublished) I showed that six additional combinations should be made and one new species recognized. The majority of these combinations are simple transfers from *Senecio* to *Roldana*, based on their morphological affinities to other species in *Roldana*. The newly described species *R. tlacotepecana* is morphologically intermediate between *R. pinetorum* and *R. metapeca*. Its capitula is similar in form to *R. pinetorum*, while the leaf morphology is similar to *R. metapeca*. *Roldana tlacotepecana* grows on rocky slopes at elevations of 2900–3500 m in Guerrero, Mexico.

In my dissertation I grouped the species of *Roldana* into six artificial clades based on similar habit and distribution. *Roldana gonzalezi*, *R. hirsuticaulis*, *R. neogibsonii*, and *R. sundbergii* are part of a group of species that is made up predominantly of woody shrubs and small trees that have a persistent tomentum, which may be tawny on the stem, and a dense lanate tomentum on the undersurfaces of the leaves. *Roldana gonzalezi* and *R. sundbergii* are pe-

rennial herbs but were included due to their tawny pubescence. The species of *Roldana* with this form of habit are concentrated about the Transmexican Volcanic Belt and Sierra Madre del Sur, but also extend northward along both the Sierra Madre Oriental and Occidental as well as southward into Central America.

Roldana gonzalezi (B. L. Turner) Funston, comb. nov. Basionym: *Senecio gonzalezae* B. L. Turner, *Phytologia* 57: 377. 1985. TYPE: Mexico. Durango: mpio. de Mezquitlan, 3 km S de Sta. Ma. de Ocotan, 17 Oct. 1984, M. González 1558 (holotype, TEX not seen).

Specimen examined. MEXICO. **Jalisco:** 74 km WNW of Huequilla El Alto, Jalisco near Canoas, mpio. Mezquitlan, 2700 m, 22 Oct. 1983, D. E. Breedlove 59182 (CAS).

Roldana hirsuticaulis (Greenman) Funston, comb. nov. Basionym: *Senecio hirsuticaulis* Greenman, *Publ. Field Columbian Mus., Bot. Ser.* 2: 280. 1907. TYPE: Mexico. San Luis Potosí: en route from San Luis Potosí to Tampico, Dec. 1878 to Feb. 1879, E. Palmer 1114 (holotype, GH; isotype, NY).

Additional specimens examined. MEXICO. **Nuevo León:** trail from Potrero Redondo to Laguna Sanchez, mpio. Villa Santiago, 16 Aug. 1939, Muller 2748 (GH, MICH, UC). **San Luis Potosí:** chiefly in the region of San Luis Potosí, 22°N latitude, 2000–2500 m, 1878, Parry & Palmer 539 (GH). **Tamaulipas:** 5 mi. NW, vicinity of Gomez Farias, Harrell 359 (MO); W of Gomez Farias on road to Rancho del Cielo, McCarten 2605 (MICH); N of Frank Harrison's, Rancho del Cielo, in Sierra de Guatemala above Gomez Farias, Sharp 52267 (NY).

Roldana neogibsonii (B. L. Turner) Funston, comb. nov. Basionym: *Senecio neogibsonii* B. L. Turner, *Brittonia* 37: 119. 1985. TYPE: Mexico. Veracruz: mpio. Huayacocotla, orilla del camino entre Helechales y Ocotes (20°39'N, 98°26'W), 1750 m, 2 Oct. 1980, J. García P. 177 (holotype, XAL not seen).

Specimens examined. MEXICO. **Hidalgo:** Zacualtipán, 1800 m, Jan. 1940, Martínez s.n. (F); Zacualtipán, 1800 m, 15 Dec. 1939, Martínez s.n. (GH). **Puebla:** mts.

W of Huauchinango, 1 Nov. 1943, *Lundell 12633* (MICH); Puente Madera, SE of Tepehuaquila, road to Zacatepec, mpio. Huauchinango, 20°5'N, 98°2'W, 2000 m, 26 Feb. 1987, *Tenorio L. 12688* (KSC).

Roldana sundbergii (B. L. Turner) Funston, comb. nov. Basionym: *Senecio sundbergii* B. L. Turner, *Brittonia* 37: 117. 1985. TYPE: Mexico. Nuevo León: mpio. Galeana, ca. 25 km S of Iturbide, along main road to Agua Blanca, 10.6 km W of Ejido la Purísima, ca. 2100 m, in open pine-oak forest, 27 Oct. 1982, *S. Sundberg et al. 1921* (holotype, TEX not seen; isotypes, KSC, NY).

Additional specimens examined. MEXICO. **Nuevo León:** areas cercanas a Cola de Caballo, 100°10'W, 25°23'N, 27 Oct. 1982, *J. A. Villarreal V-4204* (KSC); areas cercanas a Cola de Caballo, bosque mesofilo de montaña, 100°10'W, 24°23'N, 100 m, 24 Oct. 1987, *J. A. Villarreal 5546* (MO).

Roldana mezquitlanensis is part of a group of species in *Roldana* that are woody shrubs and small trees that have a stipitate glandular pubescence, which includes multicelled trichomes. The species are principally distributed in the highlands of Guatemala and Central America. However, *R. mezquitlanensis* and *R. hintonii* are the two exceptions, occurring in the Sierra Madre Occidental and Transmexican Volcanic Belt, respectively.

Roldana mezquitlanensis (B. L. Turner) Funston, comb. nov. Basionym: *Senecio mezquitlanensis* B. L. Turner, *Phytologia* 71: 56. 1991. *Senecio gesnerifolius* B. L. Turner, *Phytologia* 62: 75–77. 1987, non *S. gesnerifolius* Cuatrecasas, *Fieldiana, Bot.* 27: 33. 1950. TYPE: Mexico. Durango: mpio. De Mezquital, 26.5 km de La Guajolota por el camino a Platanitos, bosque de enzon-pino, 2610 m, 15 Mar. 1985, *M. González 1677* (holotype, TEX not seen).

Senecio mezquitlanensis was Turner's replacement name for the later homonym *S. gesnerifolius* B. L. Turner.

I have seen only an illustration of this species. However, both Billie Turner (pers. comm.) and Jose Luis Villaseñor (pers. comm.) agree that it should be placed in *Roldana*.

Roldana anisophylla is a suffruticose shrub with stipitate-glandular pubescence. It grows in the Sierra Madre del Sur mountain range. This makes it similar to a group of ca. 10 other species in *Roldana* that are primarily distributed throughout the Transmexican Volcanic Belt, with southern extensions into the Sierra Madre del Sur and northern species along the Sierra Madre Oriental.

Roldana anisophylla (Klatt) Funston, comb. nov. Basionym: *Senecio anisophyllus* Klatt, *Leopoldina* 24: 124. 1888. TYPE: Mexico. Oaxaca: Pelado, *Liebmann 160* (holotype, GH not seen; isotypes, GH drawing, MO tracing).

Roldana cronquistii H. Robinson & Brettell, *Phytologia* 27: 417. 1974. Syn. nov. *Senecio cronquistii* (H. Robinson & Brettell) B. L. Turner & T. M. Barkley, *Phytologia* 67: 392. 1989. TYPE: Mexico. Oaxaca: in wet forest 1 mi. or less S of the pass between Oaxaca and Tuxtepec, 65 mi. N of Oaxaca, alt. 9300 ft., slender shrub 1–2 m tall, with (4)5(6) rays, heads yellow, 11 Oct. 1962, *A. Cronquist 9648* (holotype, US not seen, F photo, GH photo, MO photo; isotypes, GH, KSC, MICH, NY).

Roldana cronquistii was described by Robinson and Brettell, in part, based upon their agreement with Gibson's (1969) circumscription of *Senecio hederifolius* Hemsley, under which he placed the three species *S. alienus* Robinson & Seaton, *S. chrismarii* Greenman, and *S. anisophylla* Klatt in synonymy. Robinson and Brettell separated *R. cronquistii* from *R. hederifolia* based on its having more prominent bracts in the inflorescence and under the capitula, and having much larger rays. While these characters do separate *R. cronquistii* from *R. hederifolia*, they do not separate it from the type of *S. anisophyllus*. Furthermore, Gibson reported the type of *S. hederifolius* as coming from Pilado in Oaxaca; however, I can find no evidence of this, only that it is from Mexico. Therefore, until otherwise confirmed, *R. hederifolia*'s distribution is restricted to the states of México and Michoacán, while *R. anisophylla* is restricted to Oaxaca.

Additional specimens examined. MEXICO. **Oaxaca:** 43 km N of Ixtlan-de Juarez jct., on road to Valle Nacional, 2870 m, 11 Sep. 1983, *D. E. Breedlove 60015* (CAS); carretera Ciudad de Oaxaca a Tuxtepec, cerca del Cerro Pelon, mpio. Yolox, 2850 m, 18 Jan. 1989, *Cházaro B. 5809* (WIS); N of Oaxaca, 63.1 mi. N of the junction of Hwys. 175 and 190, 17 Dec. 1977, *Funk 2720* (OS); backwoods N of Localotepec mt. Peak, 3000 m, 11 Dec. 1940, *Krueger 52* (GH, MO); km 130 Oaxaca-Tuxtepec en la carretera, 10 Sep. 1963, *MacDougall s.n.* (CAS).

Roldana tlacotepecana Funston, sp. nov. TYPE: Mexico. Guerrero: mpio. Tlacotepec, bosque de Pino en talud rocoso, 19.5 km al NE de Puerto del Gallo, camino Atoyac-Filo de Caballo, hierba de 60 cm, flor. amarilla, 2900 m, 23 Nov. 1983, *E. Martínez S. 5648* (holotype, KSC). Figure 1.

Haec species *Roldanae metepecae* (B. L. Turner) C. Jeffrey etiam *R. pinetorum* (Hemsley) H. Robinson & Brettell at videtur arcte affinis, sed a hac lamina foliari ovato-orbiculari basi cordata, ab illa capitulis radiatis distinguitur.

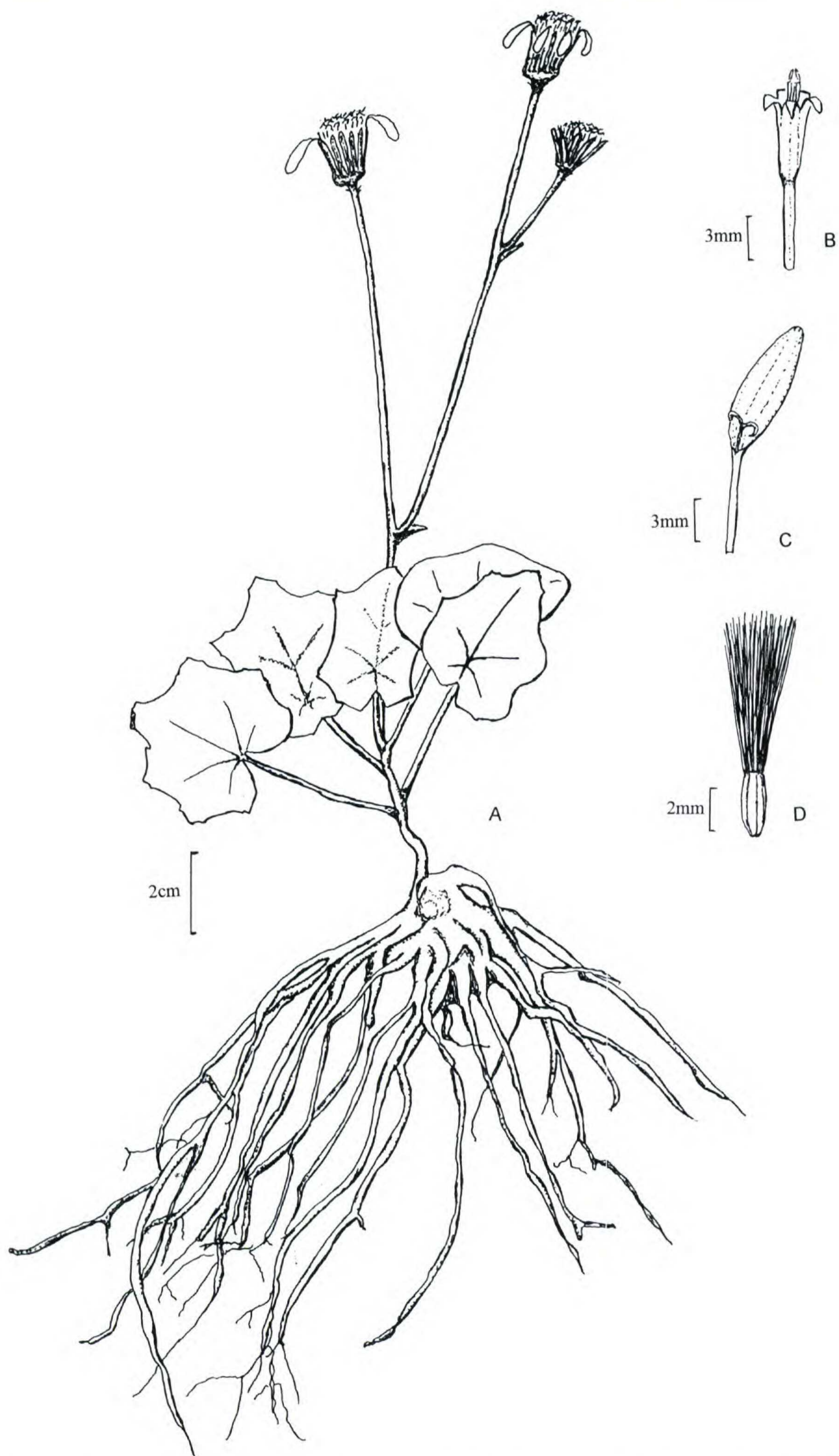


Figure 1. *Roldana tlacotepecana* Funston. —A. Habit. —B. Disc floret. —C. Ray floret. —D. Cypsela. Drawn by Funston from *E. Martínez S. 5648* and *Feddema 2918*.

Perennial herbs 20–50 cm high, arising from a rhizomatous lanate caudex, stems terete, purplish red, sparsely lanate-pubescent to tomentose in leaf axils. Leaves crowded at base to rosette-form, simple, alternate; petiole 1.5–7 cm long, sparsely pubescent with woolly trichomes or floccose, purplish red; blade 3.5–7 × 4–7 cm, ovate-orbicular, cordate at base, palmately to subpinnately veined, with ca. 6 acuminate to acute lobes 0.5–1.5 × 1–2 cm, with minute secondary lobing of callous denticles; upper blade surface glabrous, dull green, lower surface tomentose, becoming lightly so with age, greenish tan. Capitulescence a 1- to 3-headed paniculate cyme; scapiform peduncles 4.5–14 cm long; pedicels 3–8 cm long, sparsely covered with woolly trichomes at base, becoming tomentose above; bracts foliaceous, 1.5–2 × 0.5–2 cm; bracteoles linear, 10–15 × 0.5–2 mm; calyculate bracts 3 to 5, linear, 5–7 mm long, ca. 0.5 mm wide; bracteoles and calyculate bracts sparsely pubescent with woolly trichomes, deep purplish red; capitula radiate, erect at anthesis; involucre turbinate, ca. 15 mm long, 5–7 mm across at base; receptacle flat, naked, alveolate; involucre bracts ca. 14 in one apparent series, margins overlapping, the inner series with hyaline margins, linear-ob lanceolate, apex acuminate to acute, base swollen at attachment with receptacle (visible only when fresh), tips puberulent, base variously woolly, otherwise glabrous, 12–14 × 1–2 mm (excluding hyaline margins), deep purplish red becoming greenish tan at base. Ray florets ca. 8, pistillate; corolla yellow, glabrous, lamina oblong-elliptic, apex minutely 3-denticulate, tube 5–7 mm long, lamina 10–12 × 2–4 mm, 4-veined; disk florets 30 to 40, hermaphroditic; corolla yellow, glabrous, tubular, becoming narrowly funnellform at throat, apex of 5 acute lobes, recurved with age; tube 5–6 mm long, throat 4–5 mm long, lobes 1.5–2 mm long, ca. 0.5 mm wide; style branches 1.5–2 mm long; stigmatic surface of undifferentiated cells (entire); apex conical with fringing papillae; anthers ca. 4.5 mm long including appendage, apical appendage lanceolate, base sagittate to rounded, filament collar of unexpanded cells (cylindrical), endothelial cells with thickenings on vertical and transverse walls. Cypsela cylindrical, glabrous, ca. 3 mm long, ca. 1 mm wide, with ca. 10 indistinct ribs; pappus of numerous capillary bristles, in several series, persistent; bristles white, minutely barbellate, 7–11 mm long.

Distribution. *Roldana tlacotepecana* is found in

pine-oak and fir forests on rocky slopes at elevations of 2900–3500 m. It has been named after the municipality in Guerrero, Mexico, from which the only known specimens have been collected. Based on these three collections, flowering occurs in January and May.

Affinities. *Roldana tlacotepecana* is part of a group of sparsely pubescent species that may be discoid or radiate. As a group they are centered about the Transmexican Volcanic Belt with some northern and southern extensions.

Roldana tlacotepecana is one of the few small herbaceous species in the genus and appears to be related to *R. metepeca* (B. L. Turner) C. Jeffrey and *R. pinetorum* (Hemsley) H. Robinson & Brettell. Several characters separate them. *Roldana tlacotepecana* has radiate capitula, ovate-orbicular leaf blades with ca. 6 lobes and cordate base, is sparsely lanate-pubescent, and is distributed in the Sierra Madre del Sur. *Roldana metepeca* has discoid capitula, leaf blades that are suborbicular to deltoid in outline with 5 to 7 lobes and a cordate base, and a stipitate-glandular pubescence, and is located in Hidalgo along the Transmexican Volcanic Belt. *Roldana pinetorum* has radiate capitula, centrally peltate orbicular leaf blades, and a stipitate-glandular pubescence, and is distributed along the Sierra Madre del Sur and southward into Central America.

Paratypes. MEXICO. **Guerrero:** Cerro Teotepec, mpio. Tlacotepec, ca. 40 km N of Coyuca de Benítez, 3200–3500 m, 12 May 1963, *Feddema* 2918 (MICH); Cerro Teotepec, mpio. Tlacotepec, ca. 17°29'N, 100°12'W, 3400 m, 29 Jan. 1965, *Rzedowski* 207 (MICH).

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